UNIVERSITY PARK, PENNSYLVANIA

ARA case book

U.S. DEPARTMENT OF COMMERCE

AREA REDEVELOPMENT ADMINISTRATION

NUMBER 2

NOVEMBER 1963

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This study was accomplished by professional consultants under contract to the Area Redevelopment Administration. While ARA assumes no responsibility for the statements and conclusions made in this study, it believes that the problems discussed, and the solutions suggested, may be useful as a direction or indicator of experience to many communities engaged in economic development and redevelopment.

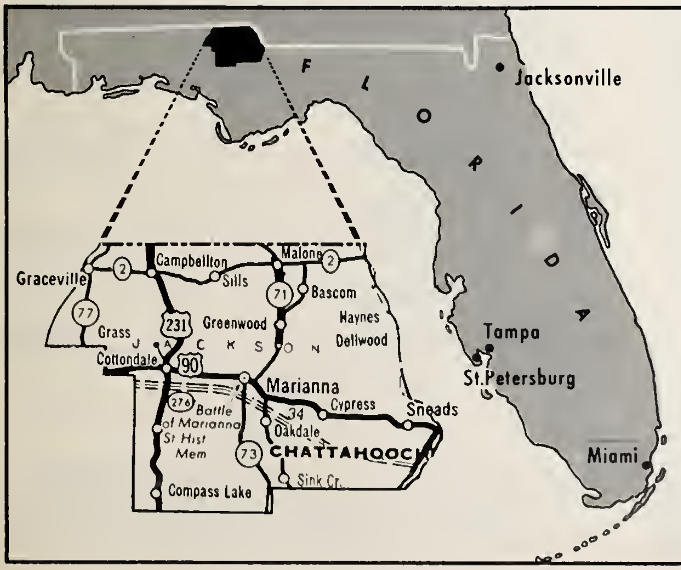
NEW PRODUCTS—NEW MARKETS

Many areas of the South have only partially shared in the benefits of industrialization and the resulting stimulus to economic activity. The obvious symptoms of this lack of development are under-utilization of available land and labor resources. The production and processing of vegetables for commercial markets is one means which might be used effectively for the economic benefit of the people in the area. Vegetable production offers the potential of expanding farm output and intensifying agricultural land use that will not add significantly to the problem of oversupply of agricultural products. Further, activities related to vegetable processing will generate non-farm employment opportunities and stimulate the economic development of the area.

An area of northwest Florida centering on Jackson County, along with contiguous areas in southeastern Alabama and southern Georgia, has not completely utilized its agricultural resources. This area presently produces a large assortment of vegetables having both fresh and processing market potentials. However, most of the output is for fresh market use and, generally, production on individual farms is on a relatively small scale.

Capacity to Produce Vegetables

It is important that farmers in areas surrounding the proposed processing plant have the know-how for producing a supply of vegetables upon which it will depend. Examination of production records of vegetables in the region indicates that farmers have this capability. A number of vegetables with processing



Case Book No. 2 – November 1963
The Economic Feasibility
of Establishing

A VEGETABLE PROCESSING PLANT
in
JACKSON COUNTY, FLORIDA

ARA Contract Approved August 27, 1962

By F. W. Williams
Economic Research Service,
U. S. Department of Agriculture
In Cooperation With
Georgia Agricultural Experiment Station,
Experiment, Georgia

An analysis of the economic feasibility of establishing a fresh vegetable canning or freezing plant in Jackson County, Florida, and estimates of the gross and net returns which might be anticipated from such a business venture.

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potential have been produced within an area reasonably accessible to Jackson County (table 1 and 2). From both the number of farms with production experience and acreage of production within the distances specified, it appears that farmers in the area are generally familiar with the techniques of producing most common types of Southern vegetables. Some of this experience (e.g., Southern peas, cucumbers, turnips and pimentos) stems from acreages of crops produced for sale to processors outside the area.

In determining the specific combination of vegetable crops offering the best potentialities, much emphasis was placed on selecting a group consistent with practical production, processing and marketing considerations. Farm resources throughout the area appear to be oriented to certain crops to an extent that no major adjustment will be necessary to support a processing operation. However, because of the capital resources required to establish processing facilities, vegetables such as green beans were eliminated from consideration. Production advantages of other sections of the country resulted in the elimination of tomatoes, potatoes, and other crops. Out of the vegetable products which had been grown in substantial volume in the area, these emerged the most likely for processing operations: Southern peas, green lima beans, turnips and collards. In order to broaden the assortment of products attractive to potential buyers, kale, mustard, spinach and speckled butterbeans were also selected.

The foregoing products are major items in vegetable consumption patterns of the Southern region, representing a reasonably complete assortment for marketing purposes, which can be run on two basic processing lines—one for beans and peas and another for leafy items. Moreover, they can be produced in the area over a relatively long season (figure 1). With these products, a well-planned production pattern and systematic programming of processing operation should provide an eight and one-half month operating season for a processing facility. This season to begin in September and extend into July of the following year. The fact that climatic conditions will allow harvest over a relatively long season appears to be a particular advantage to Jackson County.

LIMITING FACTORS

Prior to the establishment of the processing plant, it is recommended that prospective investors check thoroughly the production potential for vegetables to determine whether they can expect continued supplies of raw products to support the operation. In the long-run interests of the processing firm, farmers must be willing to produce vegetables at prices paid by the processing industry of the whole South.

Raw product pricing is complicated by higher fresh market prices than those paid by processors. Vegetable processors in the southeast normally cannot compete with fresh market prices in obtaining raw products. Contracts for vegetables which have a fresh market alternative are difficult to obtain and more difficult to enforce, because farmers sell their products in the market offering the best price. Further, the quality requirements for processing may be more rigid than for the fresh market.

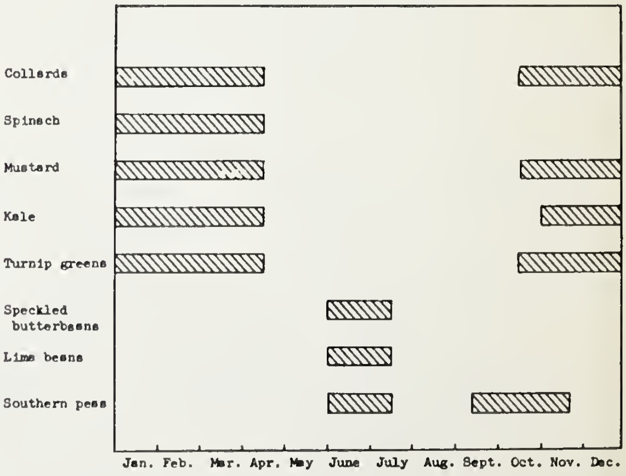
The successful operation of a processing plant requires a dependable supply of high quality vegetables in sufficient quantities and at the right times to assure continued plant operations over a season.

New processing facilities introduce an additional alternative for farm resources, but processing cannot and should not be viewed as an alternative market for existing vegetable production. The key to adequate supply of a proposed processing plant is expansion of production in the area, and it is essential that this production be geared to meet the specific needs of the facility.

Capital Requirements

Sufficient capital must be available either through local or other sources to finance the construction and operation of the proposed Jackson County plant. This capital requirement includes funds for constructing and equipping a plant, in addition to sufficient capital for operation and inventory holding as required by market conditions.

Figure 1. Harvest Seasons for vegetables suggested for Processing in Proposed Plant, Jackson County, Florida



The proposed processing plant must be designed so that minor modifications and equipment additions will allow future products.

A primary motivation in establishing a processing facility in the Jackson County area is better utilization of available labor. Semiskilled and seasonal labor is readily available to meet the needs of the plant, but difficulty may be encountered in securing qualified supervisory and management personnel. Highly capable management must be obtained; management that is sufficiently qualified and experienced to exercise general supervision of plant operations, the procurement of raw supplies, and the marketing of finished products.

The most crucial problems in the entire operation may be the locating of adequate markets for finished products. It is assumed that the output of the proposed facility will be marketed in a highly competitive situation, but that the difficulties of market entry are not insurmountable.

Table 1. Acres of selected vegetables produced within specified radii of Marianna, Florida, 1959 and 1954

Vegetable	50 mile radius of: Marianna, Florida		100 mile radius of Marianna, Florida		200 mile radius of Marianna, Florida	
	1959	1954	1959	1954	1959	1954
	Acres					
Tomatoes	1,113	2,089	2,154	5,497	4,556	11,875
Sweet corn	329	224	810	853	3,057	2,558
Cucumbers and pickles	517	1,420	912	2,837	3,197	8,564
Snap beans a/	631	929	1,801	3,497	4,456	6,782
Cabbage	151	67	789	1,262	1,717	3,584
Sweet peppers	18	34	38	65	957	65
Southern peas	4,985	4,896	6,808	7,403	19,330	15,263
Green lima beans	760	853	1,089	1,336	4,656	6,060
Squash	234	196	631	1,025	2,619	3,234
Okra	263	358	1,588	2,766	4,453	5,589
Turnips	709	115	1,027	219	1,788	219
Egg plants	16	7	23	24	178	275
Collards	187	-	243	-	449	-
Irish potatoes	149	161	246	375	1,702	3,071
Sweetpotatoes	1,070	1,294	4,879	3,971	17,138	15,037
Pimientos	16	-	26	-	4,527	-
Other vegetables	495	70	1,008	118	5,460	118

a/ Bush and pole types.

Source: U. S. Department of Commerce, Census of Agriculture, 1954 and 1959.

METHOD OF APPROACH

The analysis of the economic feasibility of establishing a vegetable processing plant in Jackson County synthesized data from numerous sources. Two completely independent analyses were made, one for a freezing plant and another for a canning plant. The freezing plant analysis was based on data obtained in a study of costs and efficiency in vegetable freezing plants located in California. The canning plant analysis drew heavily on a study of investment opportunities in sweet potato canning plants in North Carolina. The technical aspects and physical requirements of vegetable freezing and canning are sufficiently standardized that these studies provide reliable estimates of requirements for establishing a plant in Jackson County. All cost estimates based on the studies were adjusted to reflect differences in price levels in the different areas.

Supplementary data were obtained from food technologists, horticulturists, engineers, vegetable processors, manufacturers of food processing equipment, and other sources. The analyses involved a determination of all costs associated with constructing, equipping, supplying, and operating a vegetable freezing or

Table 2. Number of farms producing selected vegetables within specified radii of Marianna, Florida, 1959 and 1954

Vegetable	50 mile radius of Marianna, Florida		100 mile radius of Marianna, Florida		200 mile radius of Marianna, Florida	
	1959	1954	1959	1954	1959	1954
	Farms reporting					
Tomatoes	463	957	882	2,649	2,455	6,086
Sweet corn	175	167	427	371	1,244	958
Cucumbers and pickles	320	909	534	1,689	1,576	4,121
Snap beans [a/]	239	419	718	1,617	1,841	3,128
Cabbage	69	98	192	481	600	1,166
Sweet peppers	23	12	54	22	303	22
Southern peas	1,015	1,506	1,573	2,366	4,213	5,614
Green lima beans	395	616	700	1,036	2,374	3,343
Squash	145	127	393	525	1,382	1,437
Okra	271	310	771	1,185	2,304	2,715
Turnips	183	30	119	26	635	26
Egg plants	6	10	16	19	63	86
Collards	55	-	109	-	192	-
Irish potatoes	2,032	6,274	1,881	14,452	8,054	38,982
Sweetpotatoes	2,091	4,548	3,896	11,982	19,168	40,386
Pimientos	8	-	18	-	915	-

[a/] Bush and pole types.

Source: U. S. Department of Commerce, Census of Agriculture, 1954 and 1959.

canning plant. To derive expected net revenue, these costs were subtracted from finished product sales at market prices prevailing in 1962 for vegetables processed in the Eastern United States.

A major decision that was required early in the study involved the volume of output of the proposed plant. Economic theory indicates that, generally, economies are realized as size of plant increases up to a point, beyond which no advantages can be gained by increasing the size of the firm. There is real danger in beginning too small an operation lest unit production costs be so high that products cannot be competitively priced in finished product markets. The size criterion must also take into account the desired rate of output per hour. The rate must be sufficient to accommodate peak harvest seasons of all products, yet avoiding costly excess capacity. Consistent with minimizing unit processing costs, the plant must operate the longest possible season at near capacity.

After taking production and marketing limitations into account, consultations with food technologists, and processing equipment and container manufacturers yielded estimates of minimum economically feasible plant sizes and rates. The freezing plant analysis is based on a plant hypothetically designed to operate 2,180 hours annually for a total output of 9,550,000 pounds of finished product. The rate of output suggested is 5,000 pounds of beans or peas per hour and 4,000 pounds of leafy greens per hour. The canning plant analysis is based on a plant operating 2,180 hours for a total output of 585,000 cases of 24 number 303 cans. The rate of output suggested is 300 cases of 24 number 303 cans per hour or this equivalent in other can sizes (table 3). The plant should be adaptable to at least four can sizes, the 300 x 407, 303 x 406, 401 x 411, and 603 x 700.

The profitability of the processing operation will be largely a function of the length of season operated and the volume of pack. The large investment required for establishing a vegetable processing plant can be justified only if the plant is utilized over a continuous season and produces a near-capacity volume of product. Output rates smaller than those specified are not considered feasible since the seasonal nature of production of vegetables requires sufficient capacity to handle large volumes during limited harvest seasons.

The two separate product preparation lines suggested, one to handle peas and beans and another to handle leafy greens, are designed to operate independently, but not simultaneously. Beyond the raw vegetable preparation stages, i.e., cleaning, washing, and quality sorting, all equipment associated with packaging and freezing, or filling and canning, is common.

Table 3. Maximum and expected operating time for processing selected vegetables, proposed freezing or canning plant, Jackson County, Florida a/

Vegetable	Max. days operation	Max. hrs. operation 1 shift	Max. hrs. operation 2 shifts	Expected days operation	Expected hours operation b/	Finished product per hour: Canned c/	Finished product per hour: Frozen	Total volume: Canned c/	Total volume: Frozen
	(no.)	(no.)	(no.)	(no.)	(no.)	(1000 cases)	(1000 lbs.)	(1000 cases)	(1000 lbs.)
Southern peas	92	920	1,840	30	450	300	5	135	2,250
Lima beans	39	390	780	10	150	300	5	45	750
Speckled butterbeans	39	390	780	15	230	--	5	--	1,150
Turnip greens	151	1,510	3,020	20	300	300	4	90	1,200
Kale	138	1,380	2,760	10	150	300	4	45	600
Mustard	151	1,510	3,020	20	300	300	4	90	1,200
Spinach	88	880	1,760	20	300	300	4	90	1,200
Collards	151	1,510	3,020	20	300	300	4	90	1,200
Total	-	8,490	16,980	145	2,180	-	-	585	9,550

a/ Based on harvest seasons illustrated in Figure 1.
b/ Assumes one shift on half of operating days, two shifts on half of operating days.
c/ Cases of 24 number 303 cans.

THE FREEZING PLANT ANALYSIS

The vegetable freezing plant hypothesized for Jackson County is designed to process 4,150,000 pounds of peas and beans and 5,400,000 pounds of leafy greens, for a total seasonal output of 9,550,000 pounds. No machine is widely available at present that will satisfactorily harvest Southern peas. The rate of recovery for this product is, therefore, based on stationary shellers owned and operated by the plant. All other vegetables are expected to be machine harvested.

The recovery rates are considered realistic for the products, but will vary widely depending on product preparation techniques. The total amount of raw product required will vary with the rate of product recovery (table 4).

It is likely that the requirement for 5,812 tons of raw vegetables can be met by planting a total of about 3,840 acres. This acreage would consist of approximately 1,441 acres of Southern peas, 877 of lima beans, 916 of speckled butterbeans, 140 acres each of turnip greens, mustard, and collards, 70 of kale, and 116 of spinach. The acreage requirements will vary inversely with the percentage recovery the processor succeeds in obtaining, and with the yields per acre. The prices paid to farmers for raw product are representative of those currently paid in the Southeastern States by processors of these vegetables (table 4).

Initial Investment

Assimilation of cost data on building construction and necessary processing equipment indicates that an investment of approximately $859,794 will be required to begin the vegetable freezing operation (table 5). These costs assume a completely new and modern installation designed to accommodate the suggested volumes and operation rates with maximum efficiency. The refrigeration cycle includes 90 tons of refrigeration, cabinet (or plate) type freezers, and sufficient capacity to maintain sub-zero temperatures for storing the entire annual pack. Considerable flexibility is provided in the total refrigeration cycle to allow variations in hourly output rates and in total output capacity. Cost estimates include transportation and installation of all equipment, electrical wiring, plumbing, and heating.

The building providing housing for processing equipment is considered to be of concrete block or similar type construction, a concrete floor providing adequate drainage, and approximately a 15-year composition roof. Similar construction is assumed for the sub-zero finished product storage warehouse with a minimum of 6 inches of cork or mineral wool insulation on all sides and roof.

The annual charges shown in table 5 include normal depreciation and other fixed costs and total $107,589. This cost will be incurred whether or not the plant operates and without

Table 4. Volume of raw vegetables and acres required to supply proposed freezing plant, Jackson County, Florida

Vegetable	Finished product (1,000 lbs.)	Percentage recovery	Raw product required (tons)	Yield per acre [a] (tons)	Planted acreage required [b] (acres)	Price per ton (dol.)	Gross return per acre (dol.)
Southern peas	2,250	57.8	1,946	1.50	1,441	75	112.50
Lima beans	750	[c]93.0	403	.51	877	[c]150	76.50
Speckled butterbeans	1,150	[c]93.0	619	.75	916	[c]150	112.50
Turnip greens	1,200	95.0	632	5.00	140	35	175.00
Kale	600	95.0	316	5.00	70	35	175.00
Mustard	1,200	95.0	632	5.00	140	35	175.00
Spinach	1,200	95.0	632	6.00	116	30	180.00
Collards	1,200	95.0	632	5.00	140	30	150.00
Total	9,550	--	5,812	--	3,840	--	--

[a] Assumes machine harvest of limas, butterbeans, and greens, hand harvest of Southern peas. Yield for one cutting of all greens. A second cutting will yield an additional 1500 lbs. except only one cutting of spinach possible.

[b] Assumes 10 percent of planted acreage lost as result of weather, insects, disease, etc.; Two cuttings of turnip greens, kale, mustard and collards. Collard yield may be increased to 12,000 lbs. per acre by several hand pickings rather than machine harvest.

[c] Shelled basis. Harvested with peanut combine, purchased from farmer shelled.

regard to the volume of products packed. The cost of land for plant location is not included in cost estimates.

Processing Costs

The percentage distribution between retail and institutional styles of pack used in the cost analysis is based on the premise that the processed vegetable market will demand an approximate ratio of 75 percent retail and 25 percent institutional. The assumptions regarding size are considered realistic for this operation. and costs and returns are so allocated. However, the ratios in which various sizes are packed determine the costs and revenue expected from the products.

Another alternative type of pack, bulk packaging, is omitted from this analysis because it is adapted only to free-flowing products and is not a dominant packaging method for most vegetables frozen in the South. It is, however, an attractive alternative for plants shipping to other processors for repacking into smaller size containers. Bulk packaging is used extensively in plants packing free flowing products to increase volume when packaging is a factor limiting volume. This is a common practice during peak harvest seasons. Later, when the plant might otherwise be idle, bulk packages are removed from storage and repackaged in retail or institutional size containers.

Common costs

The common costs of plant operation, totaling $166,204, are incurred in packing all products during a year of plant operation (table 6). These are largely overhead, or fixed costs which remain stable regardless of the volume of products packed. The allocation of common costs to individual products is based on the proportionate volume of each product packed.

Management, labor, and administration includes a general manager, production supervisor, maintenance and repair men, bookkeeping and clerical personnel, and continuous U.S. D.A. inspection. This is the minimum number of permanently employed personnel considered practical for efficient plant operation. Other seasonal and temporary labor is included in variable costs. Total employment involves five permanent jobs and approximately 26 man-years of part time employment throughout the year.

The remaining items listed under common costs are fixed expenses resulting from the ownership of plant and necessary equipment. These costs are incurred whether or not the equipment is utilized and regardless of the

Table 5 Initial investment requirements, proposed vegetable freezing plant, Jackson County, Florida

Item	Description	Dimensions	Square feet	Cost per square foot	Total cost	Rate of annual charge a/	Annual charge
		(feet)		(dol.)	(dol.)	(pct.)	(dol.)
Building	To house preparation, packaging and freezing equipment, provide office space, service areas, sanitation facilities, and packaging material storage. A covered unloading dock is provided for raw product handling and pea shelling. Necessary plumbing, heating and electrical wiring included.	80 x 125 x 16	10,000	11.50	115,000	8.9	10,235
Building	To provide -10° F storage for 9.55 million pounds of finished product	120 x 140 x 20	16,800	20.00	336,000	8.9	29,904
Equipment	Includes all necessary equipment installed, for packing, freezing, and storing a total of ten million pounds of southern peas, lima beans, speckled butterbeans, and leafy greens. Equipment will handle 5,000 pounds of peas or beans per hour or 4,000 pounds of greens per hour.	--	--	--	367,244	16.5	60,594
Fork trucks	Two, standard type, 4,000 pounds capacity, gas driven, delivered	--	--	--	11,550	16.5	1,906
Miscellaneous equipment	Pallets, machine shop tools, pick-up truck, office equipment, cleaning equipment, etc.	--	--	--	30,000	16.5	4,950
Total		--	--	--	859,794	-	107,589

a/ Annual building charges of 8.9 percent include depreciation, 2.5 percent; tax 1 percent, insurance, 1 percent; interest on investment, 3 percent, and repairs 1.8 percent. Charges of 16.5 include depreciation 10 percent; taxes, 1 percent; insurance, 1 percent; interest on investment, 3 percent; and fixed repairs and maintenance, 1.5 percent.

degree of utilization. Annual charges for equipment are included in the processing stages—preparation, packaging, casing, and freezing and storage.

Variable costs

Variable costs are those which vary in direct proportion to the volume of products packed and the length of operating season. These costs are incurred only while the plant is in operation. All costs associated with the seasonal employment of labor and other input factors required in the processing operation except costs of raw product procurement, are included in the variable cost category.

The total variable costs associated with the proposed freezing operation amount to $433,152 (table 6). Addition of these costs to common costs results in total expected processing expenses of $599,701 annually.

Packaging is the largest component of variable cost since this includes the cost of cartons, overwraps, and shipping containers as well as other costs associated with packaging. Packaging costs are greatly influenced by the size of packages, whether retail or institutional. Retail size is defined as 8 ounce to 1½ pound cartons and institutional as 1½ pound to 5 pound cartons. Costs of packing larger sizes and in polyethylene bags is excluded. The costs associated with the size of packages vary primarily as a result of the cost of packaging and packaging materials, casing, and the use of equipment unique to particular sizes.

The quality of raw product purchased influences variable processing costs. Poor quality raw vegetables or those containing excessive amounts of foreign material will necessarily slow the movement of product through the plant. Additional quality grading personnel will be required if finished product quality is maintained. Both of these factors tend to increase per unit processing costs.

Operating Capital Requirements

The seasonal nature of vegetable processing results in a high operating capital requirement during the period of harvesting and processing. This creates the necessity for flexibility in the amount of capital required during the year. The costs of packaging materials, labor, and raw products must be met at a time when inventory is being increased rather than at a time when inventory is declining with a resulting increase in the amount of available capital.

In the hypothetical plant analysis in this study, the total season investment in inventory amounts to approximately $1,200,000 (table 7). This amount, while invested in inventory, is not available to meet current operating expenses. Assuming that sales of all finished products are spread equally over a 12-month

Table 6 Common and variable costs of freezing peas and beans in a proposed plant, Jackson County, Florida[a/]

Cost category	Southern peas		Lima beans		Speckled butterbeans		Turnip greens	
	75% Retail	25% Inst.	75% Retail	25% Inst.	75% Retail	25% Inst.	75% Retail	25% Inst.
Common costs								
Management, labor and administration b/	10,415	3,471	3,471	1,157	5,324	1,775	5,558	1,853
Misc. equipment c/ d/	875	291	292	97	447	149	467	155
Fork trucks d/	336	112	113	37	171	57	180	60
Building e/	1,807	602	602	201	924	308	965	322
Warehouse e/	5,282	1,761	1,760	587	2,700	900	2,819	940
Preparation d/	3,914	1,305	727	242	1,115	372	917	306
Packaging d/	4,694	1,565	1,565	521	2,399	800	3,044	1,015
Casing d/	223	75	74	25	115	38	120	40
Freezing and storage d/	2,886	962	962	320	1,475	492	1,540	513
Total	30,432	10,144	9,566	3,187	14,670	4,891	15,610	5,204
Variable costs[f/]								
General and supervisory labor	8,489	2,829	2,830	943	4,339	1,446	4,527	1,509
Preparation	12,505	4,168	3,263	1,087	5,002	1,668	14,877	4,959
Packaging	31,603	2,038	10,566	673	16,176	1,037	19,476	1,317
Casing	9,667	672	3,232	278	4,948	435	5,148	360
Storage g/	2,640	880	900	300	1,380	460	1,800	600
Fork truck	1,300	433	434	144	665	221	882	294
Misc. equipment c/	506	169	169	56	259	86	342	114
Water h/	6,629	2,209	2,110	703	3,235	1,078	3,780	1,260
Total	73,339	13,398	23,504	4,184	36,004	6,431	50,832	10,413
Grand Total	103,771	23,542	33,070	7,371	50,674	11,322	66,442	15,617

period, the average monthly investment in inventory during the year would be about $600,000. To the extent that inventory is not completely exhausted at the end of the first operating year, funds must be available for operating the second season even though much capital might still be committed to inventory.

Capital must be available, therefore, for holding inventory in addition to meeting expenses during the processing season. Funds must be available to pay farmers for raw product. The purchase of 5,812 tons of raw product, as hypothesized in the analysis, requires approximately $390,000 (table 7). Other variable costs amounting to about $433,000, must be met during the processing season. The seasonal capital requirement for variable costs, raw product purchases, and inventory holding totals over $1,200,000.

Estimated Gross and Net Returns

In deriving net returns, all costs that could be determined were deducted from gross revenue. It must be realized, however, that these are the best available estimates only and should be viewed as such by prospective investors.

Once estimates of total annual processing costs are made, including annual costs associated with ownership of plant and equipment, the only major costs remaining are those associated with raw product procurement and selling. The total of all costs, $1,201,595, subtracted from anticipated gross returns of $1,418,725, yields expected net revenue for the entire operation of $217,130 (table 7). This net revenue estimate takes into account all costs except land, income taxes and interest on operating capital.

Transportation cost estimates are based on the expectation that the processing firm will quote delivered finished product prices. If this is done, transportation costs for finished product delivery are estimated at $138,484.

Selling costs of $70,940 are based on the

Table 6 (continued)

Cost category	Kale		Mustard		Spinach		Collards		Grand total
	75% Retail	25% Inst.	75% Retail	25% Inst.	75% Retail	25% Inst.	75% Retail	25% Inst.	
Common costa									
Management, labor, and administration b/	2,777	926	5,558	1,853	5,558	1,853	5,558	1,853	58,960
Misc. equipment c/ d/	233	78	467	155	467	155	467	155	4,950
Fork trucks d/	90	30	180	60	180	60	180	60	1,906
Building e/	482	161	965	322	965	322	965	322	10,235
Warehouse e/	1,409	469	2,819	940	2,819	940	2,819	940	29,904
Preparation d/	459	153	917	306	917	306	917	306	13,179
Packaging d/	1,523	507	3,044	1,015	3,044	1,015	3,044	1,015	29,810
Casing d/	60	20	120	40	120	40	120	40	1,270
Freezing and storage d/	770	256	1,540	513	1,540	513	1,540	513	16,335
Total	7,803	2,600	15,610	5,204	15,610	5,204	15,610	5,204	166,549
Variable costs f/									
Gen. & supervisory labor	2,264	754	4,527	1,509	4,527	1,509	4,527	1,509	48,038
Preparation	7,439	2,479	14,877	4,959	14,877	4,959	14,877	4,959	116,955
Packaging	9,781	162	19,476	1,317	19,476	1,317	19,476	1,317	146,755
Casing	2,585	178	5,148	360	5,148	360	5,148	360	44,027
Storage g/	1,125	375	1,800	600	1,800	600	1,800	600	17,660
Fork truck	551	184	882	294	882	294	882	294	8,636
Misc. equipment c/	214	71	342	114	342	114	342	114	3,354
Water h/	2,363	787	3,780	1,260	3,780	1,260	3,780	1,260	39,274
Total	26.322	4,990	50,832	10,413	50,832	10,413	50,832	10,413	433,152
Grand total	34,125	7,590	66,442	15,617	66,442	15,617	66,442	15,617	599,701

a/ Assumes 75 percent of pea and bean packs in 10 ounce, and greens in 12 ounce retail cartons, and 25% of pack in 2 1/2 pound institutional cartons.

b/ Labor costs include 6 percent fringe benefits.

c/ Includes pallets, machine shop equipment, truck, office equipment, and cleaning equipment.

d/ Computed as 16.5 percent of initial investment including depreciation, 10 percent; taxes, 1 percent; insurance, 1 percent; interest on investment, 3 percent and fixed repairs and maintenance, 1.5 percent.

e/ Costs computed at 8.9 percent of initial investment including depreciation, 2.5 percent; taxes, 1 percent; insurance, 1 percent; interest on investment, 3 percent; and repairs, 1.4 percent.

f/ Power and fuel costs and variable repairs on all equipment included in each operating stage. Power charge based on 44.5 KWH per hour at .0125 per KWH. Natural gas fuel costs estimated at 58.2 cents per 1,000 cubic feet at 1,100 BTU per hour.

g/ Assumes turn-over of inventory once annually.

h/ Water cost for peas and beans, 25,000 gallons per hour at 15 cents per 1,000; for greens, 28,000 gallons per hour at 15 cents per 1,000.

premise that part of the finished product will be sold through brokerage firms, which charge fees averaging about 3 percent of gross, and part of the pack will be sold by the processing plant management. To the extent that plant management handles sales, brokerage fees can be reduced. However, if additional personnel must be employed by the firm to perform the selling function, an additional selling cost will be incurred at least equal to the cost of brokerage. Many plants rely heavily on brokerage firms to perform the selling function and only very large plants normally rely on a sales force within the firm to sell all of the finished product. Also included in selling costs is a 2 percent discount for cash within 10 days of delivery.

The cost of raw product is derived from the price which farmers are paid for raw vegetables. The prices used are those currently paid by processors to growers in the Southeast for vegetables for processing. These prices will vary over time. No analysis is attempted in this study to determine whether or not farmers in the area can produce vegetables profitably at the prices shown. These are, however, the prices paid by other processors and are those which must be considered competitive by the proposed processing firm. The prices include transportation to plants and as such are the total prices paid by processors to growers.

All costs used in the analysis are considered realistic for the Jackson County area in view of current costs experienced by the vegetable

Table 7 Estimated costs and returns of proposed vegetable freezing plant, Jackson County, Florida

Vegetable	Total pack	Cost			Raw product		Total cost	Sale price per pound delivered[c]	Revenue	
		Total processing	Transportation[a]	Selling[b]	Amount	Total cost			Gross	Net[d]
	(1000 lbs.)	(dol.)	(dol.)	(dol.)	(tons)	(dol.)		(cents)	(dol.)	(dol.)
Southern peas										
75% retail	1,688	103,771	27,008	16,036	1,460	109,500	256,315	19.00	320,720	64,405
25% inst.	562	23,542	5,620	4,637	486	36,450	70,249	16.50	92,730	22,481
Lima beans										
75% retail	563	33,070	9,008	5,349	302	45,300	92,727	19.00	106,970	14,243
25% inst.	187	7,371	1,870	1,543	101	15,150	25,934	16.50	30,855	4,921
Speckled butterbeans										
75% retail	863	50,674	13,808	8,630	464	69,600	142,712	20.00	172,600	29,888
25% inst.	287	11,322	2,870	2,511	155	23,250	39,953	17.50	50,225	10,272
Turnip greens										
75% retail	900	66,442	14,400	5,625	474	16,590	103,057	12.50	112,500	9,443
25% inst.	300	15,617	3,000	1,538	158	5,530	25,685	10.25	30,750	5,065
Kale										
75% retail	450	34,125	7,200	2,813	237	8,295	52,433	12.50	56,250	3,817
25% inst.	150	7,590	1,500	769	79	2,765	12,624	10.25	15,375	2,751
Mustard										
75% retail	900	66,442	14,400	5,625	474	16,590	103,057	12.50	112,500	9,443
25% inst.	300	15,617	3,000	1,538	158	5,530	25,685	10.25	30,750	5,065
Spinach										
75% retail	900	66,442	14,400	5,625	474	14,220	100,687	12.50	112,500	11,813
25% inst.	300	15,617	3,000	1,538	158	4,740	24,895	10.25	30,750	5,855
Collards										
75% retail	900	66,442	14,400	5,625	474	14,220	100,687	12.50	112,500	11,813
25% inst.	300	15,617	3,000	1,538	158	4,740	24,895	10.25	30,750	5,855
Total	9,550	599,701	138,484	70,940	5,812	392,470	1,201,595	--	1,418,725	217,130

[a] Transportation costs computed on basis of delivery east of Mississippi River at the rate of 1.6 cents per pound.

[b] Selling costs computed at 5 percent of gross revenue to include brokerage fees, sales commissions, and other cost directly incurred in product sales. Also included is a 2 percent discount for cash payment within 10 days of sale.

[c] Sale price is gross return to processor and includes transportation charges. Sale prices based on lima beans and spinach, Grade A retail, Grade B inst. Price source: Quick Frozen Foods, E. W. Williams Pub., Inc., New York, N.Y., April 1962 - May, 1963.

[d] Gross return less costs of raw product, processing, transportation of finished product, and selling.

freezing industry. The costs of the various input factors, as well as the market price of finished products, vary over time. These variations in costs of input factors and selling prices cannot be accurately predicted.

Every effort was made to determine the most accurate cost and revenue projections possible. Taking this into consideration, and based on the limitations previously noted, there appear to be feasible economic opportunities for investment in vegetable freezing in the Jackson County area.

THE CANNING PLANT ANALYSIS

The canning plant cost analysis is based on output of cases of 24 number 303 cans although the plant is designed to handle other retail and institutional size containers. Information was not available on which to base an allocation of labor, equipment, overhead, and other costs for the various container sizes suggested. The analysis is complete only for the case of 24 number 303 cans and determination of expected costs and revenue from other can sizes will require additional cost analysis.

The products and volumes suggested for the canning plant are Southern peas, 135,000 cases; lima beans, 45,000 cases; kale, 45,000 cases; and turnip greens, mustard, spinach, and collards, 90,000 cases each, a total of 585,000 cases of 24 number 303 equivalent. To pack this volume will require about 7,000 tons of raw vegetables that can be produced on approximately 3,500 acres of land (table 8). The proportions of total pack allocated to different vegetables is suggestive only, and the amount of each product packed will depend upon production and market considerations.

The speckled, or dark fresh, lima beans are not as well adapted to canning as to freezing and a market for the canned product is not adequately developed to consider this product a priority item in the initial establishment of the canning plant. The plant is designed to contain two processing lines, one for beans and peas, another for leafy greens, both to operate at up to 375 cases of 24 number 303 cans equivalent per hour.

Initial Investment

The building and equipment requirements are based on a plant designed to meet the specifications of product, volume, and production rates indicated above. The buildings are considered the minimum necessary to accommodate the processing operation and provide adequate storage for finished product. Building costs amount to $184,960 and include concrete block or similar type construction, a concrete floor providing adequate drainage, and approximately a 15 year composition roof. Equipment manufacturers suggested the necessary equipment and estimated costs for a processing operation designed for maximum operating efficiency. Total equipment costs are estimated at about $165,000 including transportation and installation charges. The total investment required for establishing a new facility is estimated to be about $350,000 (table 9).

Processing Costs

Common costs

Common costs are those associated with the entire plant operation and are incurred in the processing of all products. The allocation of common costs to individual products is based on the proportion of total pack represented by each vegetable processed, although total common costs remain unchanged regardless of the volume of total pack.

The common costs required to operate the proposed canning plant amount to $87,350 annually (table 10). Management and labor charges of $39,000 included in the common cost category are for year-round employees paid on an annual basis. Total employment involves five permanent jobs and approximately 26 man-years of part time employment throughout the year. Fixed costs such as buildings and equipment reflect the costs associated with ownership of the processing facility and are included in common costs.

This initial investment will result in annual charges of $43,703, including normal depreciation and other fixed costs. This cost will be incurred regardless of the volume of product packed, thus emphasizing the importance of packing the largest possible volume to minimize fixed costs per unit of output.

Variable costs

Variable costs are directly proportional to the volume of products processed and were computed individually for each vegetable. The charges for water, power, and fuel are based on rates considered typical for the Marianna, Florida area (table 10). Fuel costs are estimated for fuel oil although the use of gas for steam generation, heating water, etc., does not differ too greatly from these estimates.

Prices of packaging materials are considered representative of those currently paid by Southeastern processors. Packaging material costs, estimated at $635,497, will vary depending on the source, quantities purchased, financing arrangements, and the possibility for "back-haul" on trucks transporting finished products. Estimates of packaging material costs are based on the assumption that 100 percent of the product is packed in cases of 24 number 303 cans.

Labor is a large component of variable costs estimated at about $70,000. This is primarily common labor employed on a seasonal basis only while the plant is operating. The wages estimated for such labor are based on minimum wage legislation and include 6 percent for fringe benefits. Total annual personnel costs for operating the plant are estimated at about $115,000 (table 11).

Variable costs represent about 89 percent of the total annual cost of plant operation. The total annual cost is estimated at $825,000.

Operating Capital Requirements

In addition to building construction and equipment costs, funds must be available to cover operating costs during the processing season. The greatest cost incurred is for packaging materials, amounting to $635,000. This cost will vary directly with the amount of product packed, as will other variable costs amounting to $102,000. The cost of raw product, $378,320, must be available for payment to farmers for raw vegetables delivered to the plant for processing. These variable costs total $1,116,101. Further, common costs for the seasons' operation must be covered in the amount of $87,350, bringing the total requirement for operating capital during the processing season to $1,203,451, excluding selling costs incurred when finished product is sold.

If it is assumed that the finished product will be sold in equal amounts monthly throughout the year, part of the operating capital can be recovered during the processing season. However, a charge of 6 percent should be made on the average amount of operating capital outstanding during the year. If an average of one-half of the total operating capital of $1,203,451 is outstanding during the year, interest will be $36,104. This charge is a true cost incurred for the use of the operating capital.

The direct cost incurred in holding canned finished product is considerably less than the cost of holding frozen finished product in that refrigeration costs are not applicable to the canning operation. The primary cost involved in holding inventory in both instances will be the commitment of capital to inventory. If inventory is completely exhausted over a 12 month period, the average amount of capital committed will be equal to one-half of the total investment in inventory.

Estimated Gross and Net Returns

The estimated gross revenue of $1,424,250 was obtained by multiplying the total number of cases packed by the anticipated f.o.b. plant sale price. Processing, selling, and raw product costs amounting to a total of $1,274,664 were deducted from gross revenue to obtain total net revenue of $149,586 (table 12). Since the sale prices are f.o.b. processing plant, it is assumed that any transportation costs incurred by the processor will be shifted to the buyer of finished product and no transportation charges will be made.

Southern peas, lima beans, and spinach are

Table 8 Volume of raw vegetables and acres required to supply proposed canning plant, Jackson County, Florida

Vegetable	Finished product, 24 - 303 equiv.	Percentage recovery	Raw product required	Cases 24 - 303 per ton	Yield per acre [a]	Planted acreage required [b]	Price per ton	Gross return per acre
	(1000 cases)		(tons)	(no.)	(tons)	(no.)	(dol.)	(dol.)
Southern peas	135	57.8	2,455	55.0	1.50	1,819	75	112.50
Lima beans	45	[c] 93.0	388	115.9	0.51	813	[c] 150	76.50
Turnip greens	90	95.0	922	97.6	5.00	202	35	175.00
Kale	45	95.0	461	97.6	5.00	101	35	175.00
Mustard	90	95.0	922	97.6	5.00	202	35	175.00
Spinach	90	95.0	922	97.6	6.00	169	30	180.00
Collards	90	95.0	922	97.6	5.00	202	30	150.00
Total	585	--	6,992	--	--	3,508	--	--

[a] Assumes machine harvest of limas and greens, hand harvest of Southern peas. Yield is for one cutting of all greens. A second cutting will yield an additional 1500 lbs., except only one cutting of spinach possible.

[b] Assumes 10 percent of planted acreage lost as result of weather, insects, disease, etc.; two cuttings of turnip greens, kale, mustard and collards. Collard yield may be increased to 12,000 lbs. per acre by several hand pickings rather than machine harvest.

[c] Shelled basis. Harvested with peanut combine, purchased from farmer shelled.

the major revenue producing vegetables. Revenue produced by other greens is quite low per unit packed. The very low revenue for mustard and collards suggests that these are marginal products in the operation. However, the revenue produced by the mustard and collard packs does not accurately reflect the true profitability of these products to the processing operation. This results from allocating fixed costs to mustard and collards which, in the absence of these vegetables, can be charged to the other vegetables packed, thereby reducing the net revenue on all other items. Therefore, a decision to eliminate mustard or collards from the pack must consider the increased unit cost resulting in packing the remaining products. No product can be arbitrarily deleted from the operation as long as returns from the product will cover its variable costs and make any contribution toward fixed costs. The mustard pack returns $2,180 above its variable and fixed costs, and collards return $3,703.

The estimated revenue results from packing 100 percent of all products in cases of 24 number 303 cans and will likely vary if other can sizes are used. Consideration of the market for various sizes of containers determines size of cans in which products are packed.

CONSIDERATIONS RELATING TO MARKET ENTRY

Decisions regarding the feasibility of either a vegetable freezing or canning plant in Jackson County must reckon with the problem of getting the output of the facility into the channels of trade. Opportunities for market entry are limited, and pose difficulties equal in magnitude to those involved in establishing a processing facility and in integrating its operation with the production activities of the farmers who are to grow the raw product.

The Marketing Alternatives

Regardless of whether a freezing or a canning facility is ultimately developed in the Jackson County area, three basic alternatives are open for marketing the assortment of products contemplated and the volume of production envisioned. First, the output of the plant can be marketed by packing for an established food processor under a contractual arrange-

Table 9 Building and equipment requirements and costs for a proposed vegetable canning plant, Jackson County, Florida

Item	Description	Dimensions	Square feet	Cost per square foot	Total cost	Rate of annual charge[a]	Annual charge
		(feet)		(dol.)	(dol.)	(pct.)	(dol.)
Building	To house processing equipment and provide office space, service areas, sanitation facilities, and empty can, lid, and label storage. A covered unloading dock is provided for raw product handling and pea shelling. Necessary plumbing, heating, and electrical wiring included.	80 x 128 x 16	10,240	11.50	117,760	8.9	10,481
Building	Warehouse storage for finished product. Space provided for storage of two-thirds of total annual pack in 303 x 406 cans at 0.62 cubic foot per case. Warehouse provides net storage of 210,000 cubic feet with adequate 10 foot aisles for fork lift case handling.	128 x 140 x 20	17,920	3.75	67,200	8.9	5,981
Equipment	Includes all necessary equipment, flumes, conveyers, etc., installed for packing Southern peas, lima beans, and leafy greens at a rate of up to 375 cases per hour of 303 x 406 cans.	--	--	--	123,548	16.5	20,385
Fork lift truck	Two standard type, 4,000 pounds capacity, gas driven, delivered.	--	--	--	11,550	16.5	1,906
Miscellaneous equipment	Pallets, machine shop tools, pick-up truck, office equipment, cleaning equipment, etc.	--	--	--	30,000	16.5	4,950
Total		--	--	--	350,058	--	43,703

[a] Annual building charges of 8.9 percent include depreciation, 2.5 percent; tax 1 percent, insurance, 1 percent; interest on investment, 3 percent, and repairs 1.8 percent. Charges of 16.5 include depreciation 10 percent; taxes, 1 percent; insurance, 1 percent; interest on investment, 3 percent; and fixed repairs and maintenance, 1.5 percent.

ment. Both price and volume of output must be predetermined, and quality standards must be specified before operations begin. The activities of raw product producers and of the plant must be geared to meet the terms of the contractual arrangement in the most efficient manner possible.

The second alternative entails packing under the private labels of food chains or of food distributors. Under this arrangement, emphasis continues upon efficient plant operations. Management of a plant in Jackson County must be absolved from the major problems of marketing. These rest with the retailer or distributor. Quality levels, as well as package types and sizes, are matters of specification and plant performance and can be planned to the end of achieving operational efficiency. However, under this method of marketing, prices may vary from time to time in response to changes in market conditions. Volume requirements, both in total and by individual products, may also be somewhat less predictable than under a contractual arrangement with an established food packer.

The third alternative consists of entering directly into the mainstream of the market with the planned line of frozen or canned products. This involves competing directly with existing firms for a segment of the frozen or canned food market. Following this alternative places both the burdens of technical efficiency in plant operations and effectiveness in gaining and keeping a satisfactory market position upon the management of the proposed Jackson County plant.

Each of the foregoing alternatives has advantages and limitations. The contractual arrangements inherent in the first two relieves the proposed Jackson County firm of a considerable part of the responsibility for marketing operations. However, both the cost of such activities and some margin of profit will be reflected in the price terms of any contractual arrangement negotiated. Since contractual arrangements are subject to renegotiation on an annual basis, there is always the possibility that future terms may be less favorable than those obtained at the outset. Moreover, the bargaining position of the firm is weakened by a high degree of dependence upon a single or a few outlets for its products.

In the final analysis, the desirability of either of the two methods of packing under contract can be examined only in light of the specific arrangements which can be made with firms

Table 10 Total season costs, by product and cost category, assuming 1950 hours operation, 100 percent of pack in 303 x 406 cans, proposed vegetable canning plant, Jackson County, Florida

Cost category	Sou. peas	Lima beans	Turnip greens	Kale	Mustard	Spinach	Collards	Total
Common costs								
Management and labor	8,992	2,992	6,006	2,992	6,006	6,006	6,006	39,000
Office and bookkeeping	1,294	429	862	429	862	862	862	5,600
Buildings	3,798	1,268	2,532	1,268	2,532	2,532	2,532	16,462
Processing equipment	7,009	1,509	2,637	1,319	2,637	2,637	2,637	20,385
Misc. equipment	1,140	381	762	381	762	762	762	4,950
Fork trucks	219	73	147	73	147	147	147	953
Total	22,452	6,652	12,946	6,462	12,946	12,946	12,946	87,350
Variable costs								
Water a/	1,688	565	1,260	630	1,260	1,260	1,260	7,923
Power b/	477	159	318	159	318	318	318	2,067
Cans and lids c/	121,500	40,499	83,558	41,779	83,558	83,558	83,558	538,010
Labels c/	10,482	3,494	6,988	3,494	6,988	6,988	6,988	45,422
Cartons c/	12,015	4,005	8,010	4,005	8,010	8,010	8,010	52,065
Labor	14,940	4,584	11,511	5,756	11,511	11,511	10,323	70,136
Repairs d/	162	55	109	55	109	109	109	708
Fuel e/	4,950	1,650	3,300	1,650	3,300	3,300	3,300	21,450
Total	166,214	55,011	115,054	57,528	115,054	115,054	113,866	737,781
Grand total	188,666	61,663	128,000	63,990	128,000	128,000	126,812	825,131

a/ Water cost for greens, 28,000 gallons per hour at 15 cents per 1,000; for peas and beans, 25,000 gallons per hour at 15 cents per 1,000.

b/ Eighty-five KWH per hour at .0125 per KWH.

c/ Delivered prices assumed: cans and lids for peas and beans, .855 per case; cans and lids for greens, .882 per case; labels, .066 per case; cartons .089 each. Allowance made for 5 percent damaged cans, 15 percent damaged labels.

d/ Variable repairs computed as .5 percent of initial equipment cost per 100 hours of operation.

e/ Fuel oil-73 gallons per hour at 15.5¢ per gallon, or $11.00 per hour.

capable of using all or a substantial share of the anticipated volume of the planned processing facility. The market position of food processors, of distributors, and of food chain organizations may vary considerably and so may the nature of the contractual arrangements which can be negotiated with these firms.

The General Market Position of the Products

For either of the two types of plants under consideration, it is unlikely that justification can be found for incurring the expense involved in getting established in the market through a program of promotional activities. Advertising and other techniques of market promotion which have the objective of establishing a consumer preference for a line of products are ventures which must be undertaken with considerable intensity and over a span of several years. Neither the anticipated output of 585,000 cases of 303 equivalent cans from the canning plant nor 9.5 million pounds from the freezing plant represent volumes sufficient to justify such effort. The monetary outlays are of such magnitude that promotional activities are restricted to firms with market supplies much greater than those initially envisioned for either type of processing facility in Jackson County. Consequently, it will be necessary to enter the market with a line of frozen or canned merchandise that is essentially unadvertized and unknown to the consumer. Achieving a perceptible degree of preference for the line of products must depend upon use experience and satisfaction on the part of consumers.

The line of products to be packed is identified primarily with the consumption pattern of the South. Consequently, the major emphasis upon initial market development must be focused on this region. Transportation costs relative to other producers both within and adjacent to the Southern region will likely place further limits on the territory over which the output of the proposed plant can be distributed. Considering the locational disposition of other canning and freezing facilities, it appears that the marketing effort must be concentrated initially in Florida, Georgia, South Carolina and Alabama.

While the management of the proposed processing facility in Jackson County may well engage in direct selling activities, it is unlikely that the internal sales effort of the firm will be the most economical method of moving the entire output of products into the market. To a substantial degree, these internal efforts will have to be augmented by sales representatives who have the capacity to exploit opportunities in highly local market situations. Probably the most effective type of market representation for an unadvertised line of food products consists of food brokers. These firms provide a linkage between the processor and the myriad of firms which constitute the market. Acting as the agent of the seller, they concentrate their efforts on locating market outlets and negotiating sales. Brokers are used extensively to market processed foods produced by plants of the general size and type planned in this instance.

Under the general market conditions prevailing, it appears likely that food brokers will be used in a program of direct marketing by either type of facility in Jackson County. Operating on the assumption that such is the case, the general plans under consideration were discussed with a number of brokers in the Southern region.

Entering the Frozen Food Market

Nature of Market Competition

A freezing plant in Jackson County must be prepared to operate in a highly competitive climate. There are no market voids waiting to be filled. Every retail food outlet and institutional user of Southern vegetables currently has a source of supply. The only possible inroad lies in the degree to which users are satisfied with their existing suppliers. The South-

Table 11. Labor and managamant cost for a proposed vagatable cenning plant operating at a rata of 300 cases per hour, Jeckson County, Florida

Vegeteble	Seasonal hourly wage employees										Total hourly wagas	Total hours operetion		Total annual wages	Annual salaried employees					Total personnel cost
	Number	Rata	Number	Rate	Number	Rate	Number	Rate	Numbar	Rata		No.	Pct.		Mechanic	Production manager	Book-keeping	General manager	Misc. labor	
Southern peas	15	1.32	3	1.43	1	1.48	4	1.51	1	1.59	33.20	450	23.1	14,940	1,152	2,300	1,294	4,620	920	25,226
Lima baens	13	1.32	3	1.43	1	1.48	4	1.51	1	1.59	30.56	150	7.7	4,584	384	770	429	1,530	308	8,005
Turnip greens	20	1.32	2	1.43	1	1.48	4	1.51	1	1.59	38.37	300	15.4	11,511	770	1,540	862	3,080	616	18,379
Kale	20	1.32	2	1.43	1	1.48	4	1.51	1	1.59	38.37	150	7.7	5,756	384	770	429	1,530	308	9,177
Mustard	20	1.32	2	1.43	1	1.48	4	1.51	1	1.59	38.37	300	15.4	11,511	770	1,540	862	3,080	616	18,379
Spinach	20	1.32	2	1.43	1	1.48	4	1.51	1	1.59	38.37	300	15.4	11,511	770	1,540	862	3,080	616	18,379
Collards	17	1.32	2	1.43	1	1.48	4	1.51	1	1.59	34.41	300	15.4	10,323	770	1,540	862	3,080	616	17,191
Total	--	--	-	--	-	--	-	--	-	--	--	1,950	100.0	70,136	5,000	10,000	5,600	20,000	4,000	114,736

ern market is currently supplied by a comparatively small number of national and regional distributors, but generally these appear to be well entrenched. Effort will be required to wrest a share of the market from these firms. Very few retailers will be willing to add another line of frozen food products because of the high costs of both display and storage space. Further, neither the private brands of retailers nor the nationally advertised brand provide an opportunity for displacement. Consequently, a new firm must concentrate on gaining a segment of the market at the expense of packers and distributors of similar nonadvertised lines of Southern vegetables.

To induce buyers to shift from existing sources of supply, they will have to be shown some continuing advantage to a new line of products. However, shifts can be effected if it is, in fact, advantageous financially or operationally for buyers to do so.

Introductory Activities

Entering the market with a new line of Southern vegetables involves careful preparation. Acquiring a managerial staff well qualified and experienced in the techniques of marketing these products is a matter which must be given considerable attention. Regardless of the entry techniques employed, a market-by-market analysis is essential.

There are several techniques of market entry with the line of frozen Southern vegetables. The practice of making an introductory offer involving one case of merchandise free with each 10 cases purchased is frequently used as an inducement to obtain initial distribution.

Another approach consists of granting a promotional or advertising allowance to buyers during an introductory period. This technique offers a price advantage to the buyer and also serves to gain consumer attention for the new line of merchandise. Clearly, the size of the allowance will be the major inducement offered to retailing firms. It appears that the minimum allowance amounts to 10 cents per case, and as much as 25 cents per case might be required to interest retailing firms in the new product line. If this technique is employed, a program involving the successive promotion of individual products in the line appears to be the most effective approach. This program may continue over an extended period of time —probably six months or more. A thirty- or sixty-day introductory price can be coupled with a continuing promotional allowance for individual products as a method of gaining entry. Again, the cost of each phase of such a program will be at least 10 cents per case of goods sold, and the size of the allowance for promotion may be as much as 25 cents.

Because of the apparent high degree of competition in the frozen food field, the Jackson County plant may well weigh the cost and the potential benefits of the foregoing methods of introduction against the alternative of entering the market at a price below that of established firms. It appears that, with competitive quality levels and package assortments, a consistently lower announced price over a period of time precipitates a shift on the part of a number of buyers of frozen food products. A price differential of 1 cent per pound may be sufficient to move the 9.5 million pound output of the proposed plant with little difficulty. If

Table 12 Estimated costs and returns of proposed vegetable canning plant, Jackson County, Florida

Vegetable	Total pack cases 24 - 303's	Cost			Raw product		Total cost	Sale price per case, f.o.b. plant	Revenue	
		Total	Per case	Selling[a]	Amount	Total cost			Gross	Net[b]
	(no.)	(dol.)	(dol.)	(dol.)	(tons)	(dol.)	(dol.)	(dol.)	(dol.)	(dol.)
Southern peas	135,000	188,666	1.36	21,600	2,455	184,125	394,391	3.20	432,000	37,609
Lima beans	45,000	61,663	1.34	8,438	388	58,200	128,301	3.75	168,750	40,449
Turnip greens	90,000	128,000	1.38	9,000	922	32,270	169,270	2.00	180,000	10,730
Kale	45,000	63,990	1.38	4,500	461	16,135	84,625	2.00	90,000	5,375
Mustard	90,000	128,000	1.38	8,550	922	32,270	168,820	1.90	171,000	2,180
Spinach	90,000	128,000	1.38	10,800	922	27,660	166,460	2.40	216,000	49,540
Collards	90,000	126,812	1.38	8,325	922	27,660	162,797	1.85	166,500	3,703
Total	585,000	825,131	-	71,213	6,992	378,320	1,274,664	--	1,424,250	149,586

[a] Selling costs estimated at 5 percent of gross to include brokerage fees and sales made by plant management.

[b] Gross revenue less processing, selling, and raw product costs.

this alternative is pursued, the Jackson County firm must be prepared to maintain the price relationship for a full season, or at least until a propitious opportunity (such as short supplies of individual products) for upward price adjustment occurs. While this entails a loss of substantial revenue during the first year of operation, there is a high degree of certainty that the products can gain distribution and consumer exposure.

The prospect of price retaliation by established packers must be considered if a program of differential pricing is employed as an introductory measure. The comparatively small scale of the proposed freezing plant tends to give it an inherent advantage in this regard. Federal statutes preclude the possibility of individual market discrimination by larger firms. Clearly, matching the introductory price of the proposed plant involves revenue losses in direct proportion to the volume of goods sold. Established larger firms weigh the cost of a protracted retaliatory pricing program rather carefully against prospects of losing a relatively small share of the market.

Retail and Institutional Packs

The proposed firm must be prepared to market in both the retail and institutional sectors of the frozen food market. While both sectors are highly competitive, the institutional market is rapidly expanding.

Because of the expansion in the use of Southern vegetables in frozen form by the institutional trade, this aspect of the market must be given special attention by a new firm.

Package Sizes and Types

Buyers of retail sizes of frozen food products seek to obtain as much of their requirements as possible from a single supply source. This tends to simplify both the problem of acquisition and of transportation. Consequently, it will be necessary for the proposed freezing plant to produce a full assortment of package sizes and types in order to interest purchasers. In the case of the bean and pea products, the plant must pack in both wrapped packages and film bags.

Careful consideration must be given to determining the optimum size of bag packs for pea and bean products. Apparently, there is a trend to larger sizes in retail bag packs. Within limits, the continuing increase in home freezer storage capacity appears to justify larger retail sizes. Additionally, the economies of a more favorable product-package ratio may be a method of increasing sales. The choice of a particular size of bag within the 1.5 to 2 pound size range must take into account the probable retailing price of the package. An effort should be made to produce packages that will sell at proven effective retail prices (such as 39 cents).

The proposed firm must devote substantial effort to the development of brand names and package designs. In the typical retailing situation, the appearance of the package has considerable influence on the buying decision of the customer.

For the line of products to be produced in the plant, institutional packs in the 2.5 to 5 pound size range can be employed. These are in conformance with existing practices and pose no marketing difficulties. However, there appears to be market opportunities for larger sizes of institutional packs of Southern vegetables. The potential market for 10 and 20 pound packs needs to be examined carefully. Especially, it seems that such packages might offer possibilities for the leafy items because of the higher consumption levels of these products.

Selling Costs

The charge for sales of the planned line of Southern vegetables by food brokers amounts to 3 percent if such firms are used in marketing operations. Any firm accepting the account performs the necessary introductory work without additional cost. While not all distributors of frozen foods offer cash discounts at the present time, the trend in this direction indicates that such discounts will be a common practice in two or three years. Consequently, the proposed firm must plan on cash discounts in determining marketing costs. Based upon the trend of cash discounts, it seems reasonable to assume that in the near future the terms will be 2 percent for payment within 10 days of delivery.

Consequently, direct selling activities probably involve expenses of 5 percent of the gross revenue from the goods produced in the freezing plant. Brokerage charges are customarily based on the face value of the invoices for goods that are sold by such firms, and are not affected by discount terms.

Entering the Canned Food Market

Nature of Market Competition

The competition which a Jackson County canning plant faces involves both quality and price considerations. The competitive situation suggests that a packer who packs below established quality levels has little chance of success. To successfully operate, the products canned by the proposed firm must equal the quality of other firms packing the same items. The extra standard grade appears sufficiently good for a nonadvertised pack, but there is a distinct advantage to packing on the high side of this grade.

Price competition in the canned foods field is extremely keen, and sales diminish quickly if the line of products is priced appreciably above those of other firms. Price differences of 10 to 20 cents per case may materially alter the position of a line of products in local markets. Since most sales of canned products are on an f.o.b. basis, differences in transportation costs are frequently a consideration to buyers. Considering the general location of the proposed plant, the transportation costs to the major consuming markets of the South must compare favorably with the costs from other supply sources.

Introductory Activities

Entering the market with a nonadvertised line of canned foods clearly entails activities that precipitate a shift of buyers from the products of other packers to the new line. For reasons stated previously, the expense of direct advertising or point-of-sale promotional activities probably is too great to be employed as a means of gaining a position in the market. Consequently, price inducements are the principal means by which this can be accomplished.

There are several methods of using price inducements to gain market entry. One of these consists of setting the introductory price below the established market level. A price of 20 cents per case may be sufficient for the purpose, but a stronger inducement may be required. When introductory pricing techniques are employed, the special price remains in effect for a sufficient length of time to adequately expose the product to consumers. As a general rule, 30 days is sufficient.

A modification of the introductory price procedure consists of granting an advertising or promotional allowance to purchasers during an introductory period. Since this allowance must apply to all buyers, it has the same effect as a low introductory price, but obviates the necessity for announcing a price increase when the introductory period terminates.

It is apparent that some markets will be lost when the introductory period ends. Some buyers will take advantage of the introductory price with no intention of continuing to stock the new line. However, many with such intentions may ultimately decide to continue handling the goods if they are satisfactory and the consumer acceptance is favorable. Quantity limitations are necessary on an introductory price offer. Otherwise, large buyers may avail themselves of this opportunity to buy a large share of the inventory of goods on hand.

Another technique to employ consists of establishing a price at the competitive market level with the provision that a certain amount of the product will be given free to purchasers during an introductory period. Customarily, this procedure involves giving a case of merchandise free with each 10 purchased. In effect, this amount to a 9 percent discount from the announced price, but a somewhat lesser amount when measured in terms of costs. The advantages of this technique turn on the fact that no actual adjustment in prices is necessary following the introductory period.

Free distribution of the line to prospective customers is another method which can be employed. This entails giving retailers enough of the products for an initial display in each retail outlet, and depends upon the sales performance of the goods as a means of getting established in the market. The cost of this method of entry depends upon the number and type of retail establishments involved.

Another procedure is to start with prices slightly below the established market with the intention of keeping at this level for an extended period. While this method is expensive, it assures movement of the products into the market if they match the quality of other lines of the same items. Much of the success of this approach depends upon picking a strategic time to adjust prices upward to competitive levels. After the products are established in the distribution channels, the upward adjustment can be accomplished at a time when the demand for them is relatively strong with comparatively few customer losses. However, the general behavior of canned food prices suggests that a substantial time span may be involved in waiting for an opportunity to effect upward adjustments. Because of the highly competitive nature of canned foods, the price differential required for this procedure is quite small. The maximum required to achieve the necessary distribution need not exceed 10 cents per case.

Regardless of the introductory technique employed, considerable effort must be devoted to designing an attractive label for the product line. The investment required to obtain top caliber professional assistance for this purpose is wise. Much of the success of established nonadvertised lines of canned foods are attributed to the fact that they succeeded in capturing the attention of the consumer with an attractive label and an appealing brand name.

Retail and Institutional Packs

Considering the anticipated volume to be produced in the proposed canning plant, it appears that the firm must plan on marketing both in the institutional field and through retailing establishments. The broad base of the retail market for canned foods must be utilized in marketing operations along with the growing institutional market. The division of the output between the two sectors of the market are dependent upon the opportunities which the management sees in each. They cannot be determined at this point.

Aside from the comparatively rapid growth of the institutional market for canned foods, there are several other aspects of this sector of the market which deserve consideration. As a general rule, institutional sales are committed to use in the near future, whereas this is not necessarily true for retail sizes. Retail sizes can remain unsold on dealer shelves and materially affect the movement of products out of plant inventories. Further, an attractive label is of lesser importance for institutional packs. Sustained sales in the institutional field depend largely upon the quality of the products and the price. Since many distributors of institutional sizes of canned foods prefer to use their own labels, selling to such firms entails label allowances. Selling under the private label of a distributor also involves some added expenses arising from the necessity to interrupt operations to make label changes.

Can Sizes

The most commonly used can size in the food processing field is the 303. Because of its widespread use and acceptance, the major share of the retail pack of the proposed plant should be in this size. However, the possibilities of packing certain products in the size 300 as well as the size 303 deserve examination. For the bean and pea products especially, the smaller size 300 can might match the requirements of small families, and can be sold at a slightly lower retail price. The lower price draws attention to these products and increases the customer base to some extent. However, it does not appear that the size 300 will replace the size 303 can for these products, and the potential market advantages of the smaller can must be weighed against the added costs of packing these products in two, rather than a single, can sizes. For institutional packs of Southern vegetables, the No. 10 can is almost universally employed.

Cost of Selling

The charges of food brokers for selling this line of items may be 3 percent of the gross sales. Additionally, the selling policies of the Jackson County firm must include cash discount terms if the products are to be truly competitive in price. Current cash discount terms range from 1.5 to 2 percent, and the normal time interval is 10 days from delivery date. There is considerable evidence the cash discount rate is increasing slightly, and it is reasonable to expect that the proposed firm will offer terms of 2 percent. It is a very common practice for buyers of canned food products to take advantage of cash discount terms. Consequently, the selling activities entail expenses involving 5 percent of the gross revenue from the products that are marketed.

THE IMPORTANCE OF MANAGEMENT

The inadequacy of management is likely the most common cause of small business failures. Many firms succeed under extremely difficult conditions purely as a result of efficient and capable management. Without high caliber management, a new processing operation, which will experience many initial difficulties, will have little chance of long-run survival. In addition to a thorough understanding of raw product procurement and technical processing, management must be familiar with the field of food distribution and cognizant of its problems and pitfalls. Regardless of the extent to which the firm depends upon brokers or other firms for market representation, a thorough understanding of the intricacies of the market by the plant management is required.

OTHER CONSIDERATIONS

Plant Location

The availability of adequate utility service is a major consideration in planning the location of a vegetable processing plant. Large quantities of water, electricity, and other utilities are required. The proposed plant requires approximately 28 thousand gallons of water per hour for operation over extended periods. The water requirement necessitates storage tanks and pumping facilities adequate to provide a reliable water supply. Sewage disposal is necessary to accommodate a volume of waste approximately equal to the volume of water required in product preparation. A margin must be provided in both water and sewage capacity to permit future plant expansion. Therefore, a minimum capacity of 30 to 35 thousand gallons of water and sewage per hour must be available initially.

Sufficient electrical power and gas (or fuel oil) must be available to adequately meet the needs of the plant. These considerations might favor an urban location. However, the advantages of a rural location in view of land costs, expansion space, etc., usually out-weigh the utility advantages to be gained in an urban location.

The availability and cost of land for the plant site is another consideration. Rural land is normally more available and less costly than that in urban areas. Five to 10 acres of land can adequately accommodate the proposed plant. No cost for land is included in the processing cost or initial investment analyses. The variability of prices makes estimation difficult.

The desirability of rural versus urban location must be given careful consideration. In addition to the availability and costs of utilities and land, taxation and insurance rates on alternative sites need investigation. Taxes may be lower in the rural area while insurance rates, particularly fire insurance, will probably be higher in rural areas. One of the most important factors to consider in locating a plant is the availability of space for future expansion. This will rule out many urban locations which might otherwise be advantageous. There must be provisions for vehicle parking, shipping and receiving areas, and railroad sidings. The odors of processing and waste disposal often make rural locations more desirable. Some wastes associated with processing plants cannot be piped into standard sewage systems and other provisions must be made.

Buildings

The cost analysis in this report was based on the assumption that new buildings will be constructed to house the processing operation. A possibility exists in Jackson County for locating the processing operation in an existing building previously used as an airplane hangar. This building is located on an abandoned U.S. Air Force station which has complete water and sewage disposal systems.

If this facility is not used for a processing plant location, other provisions for land and buildings must be made. Therefore, the cost of buildings included in the analysis is realistic in view of the need for a new plant location. The adaptation of the existing facility to accommodate a processing plant will probably involve smaller costs than those estimated for initial investment in new buildings.

Raw Vegetable Supplies

No function in vegetable processing is more important than the efficient procurement of raw product. This includes commitments by producers to provide a reliable volume of high quality vegetables to the processing plant.

A commitment of supplies is only the first step in the important program of raw vegetable procurement. Scheduled planting of the proper varieties to assure staggered harvest dates is essential to an even flow of product through the plant. Many plants provide the desired varieties of seed to farmers, recommend planting and harvest dates, and schedule deliveries so that the plant operates on a continuous and regulated schedule. Delivery schedules must minimize the time lapse between harvest and processing to assure high quality finished products. Delivery programming is an intricate procedure that can mean an even flow of products through the plant, or continuous and costly interruptions in the processing operation.

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CONTENTS PAGE

NEW PRODUCTS—NEW MARKETS 1
  Capacity to Produce Vegetables 1
LIMITING FACTORS 2
  Capital Requirements 2
METHOD OF APPROACH 4
THE FREEZING PLANT ANALYSIS 6
  Initial Investment 6
  Processing Costs 7
  Operating Capital Requirements 8
  Estimated Gross and Net Returns 9
THE CANNING PLANT ANALYSIS 11
  Initial Investment 11
  Processing Costs 11
  Operating Capital Requirements 12
  Estimated Gross and Net Returns 12
CONSIDERATIONS RELATING TO MARKET ENTRY 13
  The Marketing Alternatives 13
  The General Market Position of the Products 15
  Entering the Frozen Food Market 15
  Entering the Canned Food Market 17
THE IMPORTANCE OF MANAGEMENT 19
OTHER CONSIDERATIONS 19
  Plant Location 19
  Buildings 20
  Raw Vegetable Supplies 20

* U S GOVERNMENT PRINTING OFFICE : 1964 O—716-678

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